REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-5, 9-11, 13-14 and 22-46 are presently active in this case, Claims 22-37 previously withdrawn from consideration, Claims 6 and 8 canceled by way of the present amendment, and Claims 1, 2, 11 and 13 amended and Claims 38-46 added by way of the present amendment.

In the outstanding Official Action, Claims 1, 8-9, 11 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,235,634 to White et al. in view of U.S. Patent No. 6,403,924 to Hayashi; Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over White et al. and Hayashi, and further in view of U.S. Patent No. 5,286,296 to Sato et al. and U.S. Patent No. 6,083,566 to Whitesell; Claims 4 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over White et al. and Hayashi, and further in view of U.S. Patent No. 4,389,970 to Edgerton; Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over White et al. and Hayashi, and further in view of U.S. Patent No. 6,079,928 to Theriault et al.; and Claims 10 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over White et al. and Hayashi, and further in view of U.S. Patent No. 5,735,961 to Shimada.

Turning now to the merits, in order to expedite issuance of a patent in this case, Applicants have amended independent Claims 1 and 11 to clarify the patentable distinctions of the present invention over the cited references to White et al. and Hayashi. Specifically, Applicant's independent Claims 1 and 11 have been amended to recite that the transferring arm is capable of moving between the heated process chamber and the load lock chamber to transfer the substrates one-by-one within the integrally connected zone of the heating process

chamber and in the load lock chamber. Also recited is that the gate valve shields the integrally connected heating process chamber from the load lock chamber.

By providing the heating process chamber and the load lock chamber integrally connected with each other and transferring the substrate between the main transfer mechanism provided outside the two chambers and the space by releasing opening and closable shutter provided in the load lock chamber, the substrate immediately after the heating process would not be exposed to an atmosphere outside the chamber. Also, since the substrate would be placed at the waiting position and subjected to temperature adjustment in the same atmosphere as the heating process chamber, the oxidization on the surface of the substrate can effectively be prevented.

In contrast, the cited references to White et al. and Hayashi do not disclose a transfer arm transferring the substrate one-by-one within the integrally connected zone of the heating process chamber and the load lock chamber, or a gate valve shielding the integrally connected heating process chamber from the load lock chamber. Specifically, the "shuttle" described at column 8, lines 42-43 of White et al. transfers substrates between separate units 121 and 125 of Figure 10. Moreover, the "robots" illustrated in Figures 4-6 of White et al. are used to load wafers between multiple processing chambers rather than only transferring substrates between the heating process chamber and a load lock chamber as described with respect to the present invention. Therefore, neither the "shuttle" nor the "robot" of White et al. correspond to the transferring arm that transfers a substrate one-by-one within the integrally connected zone of the heating process chamber and the load lock chamber through a gate valve as now recited in Claims 1 and 11.

With regard to Hayashi, the transfer arm 60 of this reference is not provided inside of the zone created by the heating process chamber and load lock chamber "integrally" connected with one another. Therefore, independent Claims 1 and 11 patentably define over

the cited references to White et al. and Hayashi individually and in combination. Moreover, the dependent claims in the present application provide further patentable distinctions of the cited references as described below.

First, as indicated in amended Claim 2 and the newly added Claim 39, by keeping the load lock chamber and the heating process chamber under the same pressure and constantly purging with an inert gas, the two chambers can be kept equally under "low oxygen concentration", thus the surface of the substrate can be kept under a stable condition. This feature is also not disclosed in the cited references.

In addition, the newly added Claims of 40 to 43, in the present invention, the heating process chamber has a plurality of temperature controlling areas and providing heater and cooling pipes as temperature controlling mechanism built into the surrounding walls, the temperature is accurately being controlled according to the temperature controlling area. With such structure, a generated air current can be controlled by having the temperature of the areas vary according to the region. For example, the upper current can deliberately be created by varying the temperature of the heater and the cooling pipes, so that the particles and the like vaporized from the wafer surface can be prevented from reversely affecting the wafer surface. Such structure is neither disclosed nor suggested in the above references.

Finally, with respect to Claims 44-46 a canopy member is disposed opposite to the gate valve of the load lock chamber and integrally disposed with the lid member, so that the canopy member is placed in a upper portion of the gate valve when the lid member is lifted up and placed in a lower portion of the gate valve when the lid member is lowered down.

According to the present invention, in a state of the lid member being lifted up i.e. the canopy member being placed at an upper portion of the gate valve, when an inert gas supplied to the load lock chamber flows into the heating process chamber, the canopy member guides the inert gas to flow over the surface of the substrate as illustrated in Fig. 19A

of the present invention. With such structure, the surface of the substrate can effectively be prevented from the oxidization, as an atmosphere above the surface of the substrate is purged with a constant flow of the inert gas.

In addition, the heating process chamber has a second gas supplier supplying the inert gas into a zone surrounded by the lid body and the heating plate when the lid member is lowered down i.e. the canopy member being placed at a lower portion of the gate valve. With such configuration, as the canopy member guides the inert gas to flow above the lid member to fill the heating process chamber with the inert gas, a side of the lid body which is facing the heating plate is also effectively filled with an inert gas by the second gas supplier, which leads to an effective prevention of oxidization. A feature that the canopy member being integrally provided with the lid member enables the canopy member to move simultaneously with the lid member with a single moving mechanism.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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